

PCT

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

10/538000



Applicant's or agent's file reference 21401WO	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/EP 03/14553	International filing date (day/month/year) 18.12.2003	Priority date (day/month/year) 19.12.2002
International Patent Classification (IPC) or both national classification and IPC A23L1/03		
Applicant DSM IP ASSETS B.V. et al.		

- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 6 sheets, including this cover sheet.  
  
☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

- This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☒ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand  04.06.2004	Date of completion of this report  07.03.2005
Name and mailing address of the International preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer  Seroz, T  Telephone No. +49 89 2399-7789  

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/EP 03/14553

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

1-37 as originally filed

**Claims, Numbers**

1-7, 19 (part), 20-30 as originally filed

8-18, 19 (part) received on 05.03.2004 with letter of 03.03.2004

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).  
☐ the language of publication of the international application (under Rule 48.3(b)).  
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☒ contained in the international application in written form.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority in written form.  
☒ furnished subsequently to this Authority in computer readable form.  
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
☒ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

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see separate sheet

**IV. Lack of unity of invention**

1. In response to the invitation to restrict or pay additional fees, the applicant has:

- ☐ restricted the claims.
- ☒ paid additional fees.
- ☐ paid additional fees under protest.
- ☐ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- ☐ complied with.
- ☐ not complied with for the following reasons:

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☒ all parts.
- ☐ the parts relating to claims Nos. .

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	1-9,11-13,17-21,23,26-30
	No: Claims	10,14-16,22,24,25
Inventive step (IS)	Yes: Claims	11-13,17,23
	No: Claims	1-10, 14-16, 18-22, 24-30
Industrial applicability (IA)	Yes: Claims	1-30
	No: Claims	

2. Citations and explanations

see separate sheet

**Additional remarks to item I**

This first written opinion was established on the application documents as filed and the written sequence listing pages 1-4, SEQ ID No 1 to SEQ ID No 3.

**Additional remarks to item IV**

This Authority agrees with the objection put forward by the ISA as to lack of unity because the present application does not meet the requirements of Article 17(3)a PCT in combination with Rule 13.1 PCT.

Indeed, the following two inventions are not so linked as to form a single general inventive concept.

**Invention 1: (claims 1-9, 29, 30)**

Process for the production of a food product involving one heating step, comprising the addition of asparaginase to limit the formation of acrylamide during said heating step.

**Invention 2: (claims 10-28)**

Asparaginase from *Aspergillus niger* and method for producing it.

The claimed process (claims 1-9) is not dependent on the claimed asparaginase. In addition, asparaginases have already been isolated and cloned (see for example US5310670).

As a consequence, this Authority fails to see a common technical feature among the different above identified inventions that defines a contribution over the prior art.

**Additional remarks to item V**

The present application discloses a method for producing food products involving one heating step and the addition of asparaginase from *Aspergillus niger* to limit the formation of acrylamide during said heating step.

An asparaginase from *Aspergillus niger* as well as polynucleotides encoding the same are also disclosed.

**1. Novelty (Article 33(2) PCT)**

The following documents (D) have been cited in the ISR as being relevant for assessing the novelty and inventiveness of the claimed subject matter; the numbering will be adhered to in the rest of the procedure:

- D1:** DATABASE EMBL [Online] 27 January 1994 (1994-01-27), ATKINSON ET AL.: "Production of L-asparaginase" XP002279377 Database accession no. A14577
- D2:** MOTTRAM ET AL.: "Brief Communications, ACRYLAMIDE IS FORMED IN THE MAILLARD REACTION" NATURE, MACMILLAN JOURNALS LTD. LONDON, GB, vol. 419, 3 October 2002 (2002-10-03), pages 448-449, XP002235161 ISSN: 0028-0836
- D3:** ANONYMOUS: "Mechanism(s) of Formation of Acrylamide in Food: Background" October 2002 (2002-10), XP002237515 Retrieved from the Internet: URL:[http://www.jitsan.umd.edu/Acrylamide/WG1/WG1\\_Mech\\_BG\\_Paper.pdf](http://www.jitsan.umd.edu/Acrylamide/WG1/WG1_Mech_BG_Paper.pdf) [retrieved on 2003-04-03]

D1 describes a polynucleotide sequence from *Erwinia chrysanthemi* encoding an asparaginase which is 60% identical to SEQ ID No 1 as well as the amino acid sequence of the asparaginase encoded by said polynucleotide.

A claim that relates to "a polynucleotide hybridisable to...", as stated in claim 10, without any particular restrictions concerning the hybridisation conditions embraces polynucleotides the sequences of which are very poorly identical to the sequence of the target polynucleotide.

"A functional equivalent" of an asparaginase, as stated in claims 14-16 and 22, is considered as defining any asparaginase.

Thus, because of the above-mentioned vague expressions, it seems that D1 anticipates the subject-matter of **claims 10, 14-16, 22, 24, 25** (invention 2) (Article 33(2) PCT).

## **2. Inventive step (Article 33(3) PCT)**

**i. Claims 18-21, 26-28** (invention 2) do not contain any additional technical feature that could render the claimed vector, host cell, and method for manufacturing inventive over D1 (Article 33(3) PCT).

**ii.** D2 and D3 both show that acrylamide in cooked food is formed from asparagine in accordance with the Maillard reaction.

In addition, it is well known in the art that asparaginases metabolize asparagine.

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Therefore, it appears obvious that a person skilled in the art who would like to reduce the formation of acrylamide in cooked food would treat food products that are to be cooked with asparaginase to avoid the formation of acrylamide during the heating or cooking step and arrive to the subject-matter of claims 1-9, 29 and 30.

Hence, **claims 1-9, 29 and 30** (invention 1) do not satisfy the criteria of Article 33(3) PCT.